



Computational Modeling for Protective Clothing

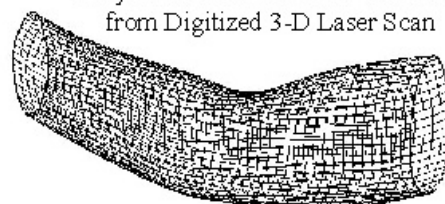
Overview:

Natick Soldier Center is developing computational models which are integrated with improved test methods. These models are used to assess the importance of coupled heat and mass transfer, combined convection/diffusion, liquid capillary transport, and concentration-dependent membrane diffusion. Realistic computational fluid dynamic models of the clothed human make it possible to directly examine the system consequences of various material properties or clothing design parameters (closures/fit).

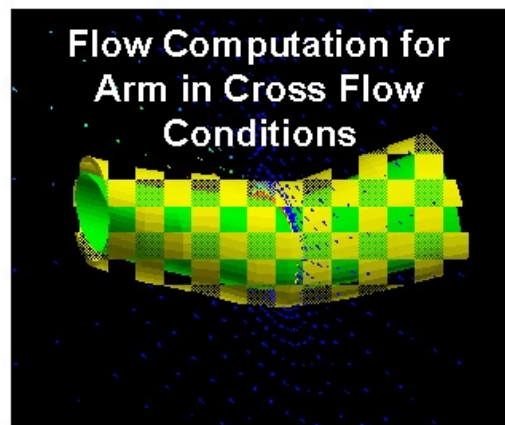
Description:

- Creation of “virtual” human thermal/protective clothing model to complement existing manikin/human evaluations
- Computational models allow more freedom to examine:
 - System Designs
 - Relative Importance of Material Properties
 - Environmental Conditions (chemical and ambient environment)

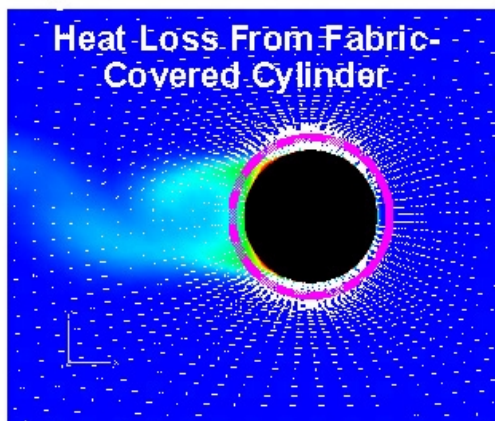
Body Surface Coordinates Obtained from Digitized 3-D Laser Scan



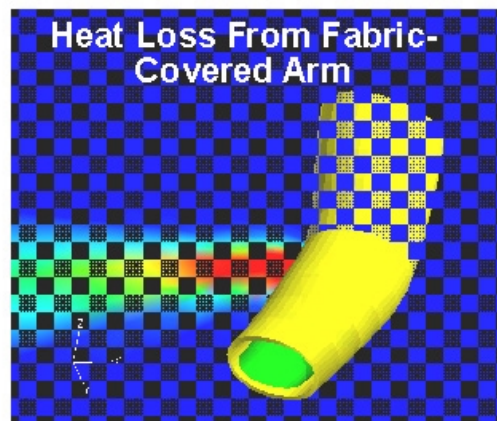
Flow Computation for Arm in Cross Flow Conditions



Heat Loss From Fabric-Covered Cylinder



Heat Loss From Fabric-Covered Arm



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